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27 April 1983 Our File: 59-14

Rogers Pass
Environmental Assessment Panel
Federal Environmental Assessment
Review Office
13th Floor, Fontaine Building
200 Sacre-Coeur
Hull, Qubec
K1A OH3

Attention: Mr. P.J. Paradine
Chairman

Dear Sir:

RE: CP RAIL ROGERS PASS DEVELOPMENT

I have now completed an initial appraisal of the documents forwarded by Guy Riverin on 06 April which comprise CP Rail's submission to the Panel. The list of information which I reviewed is appended to this letter; it is not the complete documentation but I believe it is everything available which pertains to terrain and hydrological aspects of the project.

By way of general comment, I was quite impressed by the thoroughness and quality of the geotechnical/hydrological investigations conducted by Thurber Consultants, and the geotechnical interpretation undertaken by EBA Engineering Consultants. The Thurber investigation, in particular, addresses the issues in respect of the surface route on which the Panel had requested additional information in its Preliminary Report. The MacLaren Plansearch studies on such issues as tunnel spoil disposal, treatment of tunnel wastewater, and visual impact of the project also were well done and again responded to specific information requested by the Panel.

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Notwithstanding these remarks, the extent to which CP Rail intends to incorporate certain of its consultants recommendations into the project design requires some clarification. At the 1982 Public Meetings of the Panel, in response to a question I raised on whether a terrain impact assessment would be forthcoming, Mr. Fox of CP Rail responded:

> "And I would like to put it to you this way: terrain impact can be worked into all design plans. The plans will be the terrain impact documents. All plans have to be approved by Parks and CTC."

The CP Rail plans for the project which I have examined seem to fall somewhat short of this objective. I fully recognize that construction specifications eventually will be issued which may cover off some of the "missing parts," but I believe it important that CP Rail provide the Panel (and Parks Canada) with a commitment as to their intentions at this time. These are discussed in the following paragraphs, together with questions to CP.

Right-of-way

Considerable discussion ensued at the 1982 Panel Meetings as to whether the access road right-of-way should be 100 feet or some lesser width. Possibly lost in that discussion was the eventual extent of the right-of-way. It is our understanding that CP Rail applied to the CTC (and received approval) for a 200 ft-wide right-of-way. (I have not seen these plans but was so advised by Mike McKnight of Parks Canada).

The actual extent of right-of-way (ie. top of cut to toe of fill) will be well beyond 200 feet in many instances. Specific reaches where this condition is prevalent include Sta. 152+00 to 164+00, Sta. 224+00 to 240+00, east and west of Surprise Creek, Sta. 364+00 to 374+00, and the Beaver gravel pit area. Right-of-way widths will reach 250 to over 400 feet at many of these locations. Some of this "expansion" will be inevitable particularly where fills are proposed to stabilize the slide areas. My point however, is that I am unsure as to whether Parks Canada recognize this situation. I would request the following information of CP Rail:

- What is the areal extent (ie., plan area in acres) of right-of-way which exceeds the 200 feet approved by CTC?

- Can CP Rail provide information on alternatives considered to reduce the right-of-way width requirements at the locations of major cuts and fills? This information should be specific and include the reasons for rejection of possible options.

Borrow Materials

Thurber Consultants has indicated that most of the soils along the proposed grade can be compacted at close to natural water contents into satisfactory and stable fills. I agree with that appraisal. Thurber (1983c) also identified four types of materials unsuitable for embankment construction, but which can be used as top dressing in reclamation or as toe berms in landslide areas.

Thurber (1983c) states the following:

> "The secondary borrow materials include organic or contaminated soils and wet silty soils. In the latter case, the quantity will depend on the weather during construction and the contractor's procedure in excavating, placing and compacting silty soils. The silty till soils that are classified as common borrow would become too wet for that purpose when the moisture content exceeds approximately optimum plus 2 percent."

The sensitivity of the silty till soils to change in water content and subsequent unsuitability for use as borrow is, in my view, cause for concern. It was just such a situation which caused the problems on the Lake Louise twinning. I would request the following information of CP Rail:

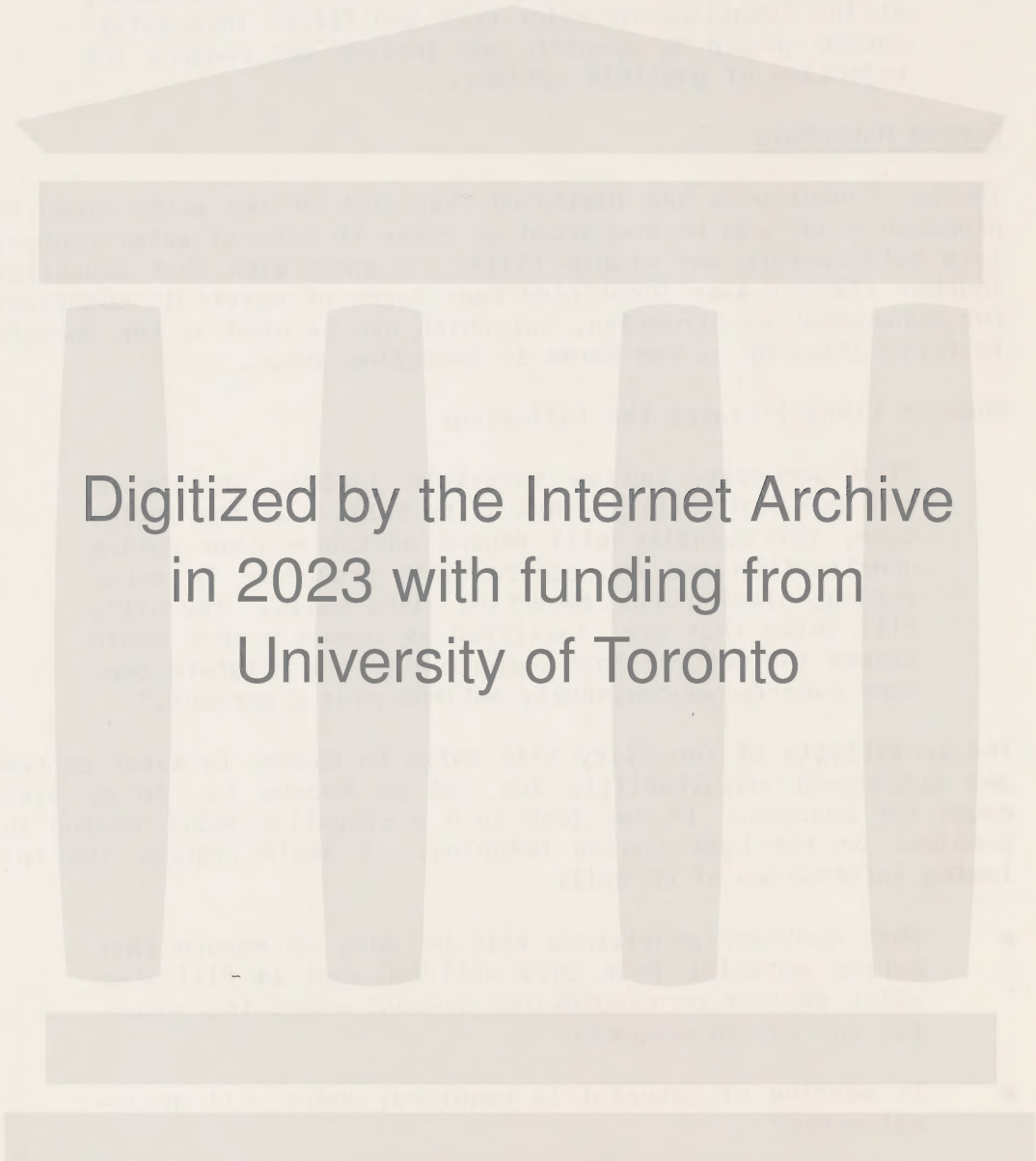
- What contract provisions will be made to ensure that borrow material from cuts will be used as fill when rainy weather or groundwater seepage makes the material too wet to compact?

- If wasting of material is required, where will disposal occur?

- How will any shortfall of material be made up?

Drainage

Thurber (1983c) identified a number of drainage issues which may be required to improve slope stability above the new grade. These included:



a) fluming of a stream that traverses the Wet Slide area;

b) fluming of streams above the grade at the Griffith Slide and at the west margin of the Unnamed Slide (the requirement was to be assessed further when the cuts have been made); and

c) draining a pond above the proposed grade at Sta. 388+00 (this may have been done already).

The concluding remarks of EBA (1983) also indicated that "the new grade can be safely constructed across these landslides provided precautions are undertaken to control surface drainage and infiltration between the existing and new alignments".

I agree completely with the need to provide drainage to ensure stability of the landslide areas. However, these measures likely will require "off right-of-way" disturbance and again the question arises as to whether Parks Canada recognizes this. I would request the following information of CP Rail.

- Assuming that the foregoing drainage measures will be implemented, plans are required which show the probable drainage schemes.

- What will the flumes look like, how much area will they disturb, and where will the water be directed?

Hydrology

Thurber (1983b) provided estimates of design flows and debris volumes for the various streams crossing the grade. Thurber has indicated that the estimates are conservative and we are in general agreement with that opinion. The design flows are considerably higher than those estimated by Dr. Adam in his December 1982 report to the Panel.

Canadian Pacific (1983c) shows general arrangements for bridge and culvert crossings which conform closely to the recommendations of Thurber (1983b). There is some discrepancy in the CP Rail submissions in respect of the Cedar Creek crossing; the bridge documents show a culvert whereas the engineering design sheets (Canadian Pacific 1983a) indicate a girder bridge. Just what CP Rail intends to do requires clarification.

My concerns relate to probable off right-of-way effects with some of the stream crossings. Thurber (1983b) suggests a requirement for a 300 to 400-ft training dyke at Mountain Creek and 15-ft high guide banks at Cedar and Raspberry Creeks. Such channelization is a practice which Parks Canada has stated they will not allow. I would request the following information of CP Rail:

- Are training dykes or guide banks to be incorporated into the design and, if so, a plan is required to show their probable extent, their cross-section, area they will disturb, and the source of materials that will be used for their construction.

- If training dykes or guide banks are not permitted by Parks Canada, what changes might be required to crossing designs presently proposed?

CP Rail propose to divert Cedar Creek to the south margin of the debris cone and bridge (or culvert) the stream at that location. CP has indicated that this was as proposed in its submission to CTC. In his report, Dr. Adam considered diversion to be at risk because of the difficulty in controlling such a high-energy stream. He had suggested an alignment change or drop strucutre as options but, in the latter case, we were under the impression that the proposed grade was some 4 feet below the present stream bed and not almost 40 feet which now seems to be the case. In view of this difference, the diversion seems a practical alternative although the control problem still will be present. I would request the following information of CP Rail:

- What will be the effect of the proposed diversion downslope from the new grade? This information should include effects on slope stability, vegetation damage, whether any further clearing will be required, etc.

Tunnel Wastewater Treatment

MacLaren Plansearch (1983b) presents options for treatment of wastewater from the tunnel boring operations ranging from fairly elaborate settling ponds to direct discharge to receiving waterbodies. The MacLaren report also evaluates a number of siting options for settling ponds. While the MacLaren work is well done, I find I have no idea of what CP Rail proposes to do. I would request the following information of CP Rail:

- Does CP Rail propose direct discharge of tunnel waste-water into the Beaver River or any other waterbody?

- What method of treatment is proposed and where will settling ponds and other appurtenances be located?

The foregoing covers additional information which should be requested of CP Rail. As I indicated previously, the geotechnical analysis is quite complete. Geotechnical properties are realistic and my inspection of the documents indicates that CP Rail has followed its consultants recommendations regarding slope design.

I will be pleased to discuss any items of the CP submission with you and the other Panel members.

Yours very truly,

I.D. SYSTEMS LTD.

L.E. Hurwitz, P.Eng.

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LIST OF PLANS AND REPORTS REVIEWED

Canadian Pacific. 1983a. Rogers Pass project. Engineering design sheets 0+00 to 600+00. Plan Nos. SP 1600-2P-216 to 225 dated March 22, 1983.

Canadian Pacific. 1983b. Rogers Pass project. Geotechnical data 0+00 to 600+00. Plan Nos. SP1600-6-206 to 215 dated March 3, 1983.

Canadian Pacific. 1983c. General bridge arrangements for the Rogers Pass project.
Plan No. B-1-3663-1 dated March 24, 1983
Plan No. B-1-3672-1 dated February 24, 1983
Plan No. B-1-3666-1 dated March 24, 1983
Plan No. B-1-3664-1 dated March 24, 1983
Plan No. B-1-3674-1 dated February 9, 1983
Plan No. B-1-3665-1 dated March 24, 1983
Plan No. B-1-3667-1 dated March 24, 1983
Plan No. B-1-3668-1 dated March 24, 1983
Plan No. B-1-3669-1 dated March 24, 1983
Plan No. B-1-3671-1 dated March 24, 1983.

Canadian Pacific. 1983d. Cross-sections for the Rogers Pass project 0+00 to 602+00. TPALIGN 5 - TPPROF 5 dated March 3 to 7, 1983.

EBA Engineering Consultants Ltd. 1982. CP Rail Rogers Pass grade improvement project surface route conceptual design evaluations. Dated December, 1982.

EBA Engineering Consultants Ltd. 1983. CP Rail Rogers Pass grade improvement project surface route evaluation of landslides. Dated February, 1983.

MacLaren Plansearch. 1983a. Environmental concerns double tracking west portal to mile 91.8 Rogers Pass project. Dated 83.03.

MacLaren Plansearch. 1983b. Treatment of wastewater from tunnel boring operations Rogers Pass project. Dated 83.03.

MacLaren Plansearch. 1983c. Construction-related erosion and downstream aquatic environments Rogers Pass project. Dated 83.03.

MacLaren Plansearch. 1983d. Visual impact assessment Rogers Pass project. Dated 83.03.

Norecol Environmental Consultants Ltd. 1983. Rogers Pass revision. Volume 3. Reclamation plan. File 30-10-3A dated February 1983.

Thurber Consultants Ltd. 1983a. Rogers Pass revision. Volume 1. Geology, geomorphology and hydrogeology. File 17-6-58 dated February 1983.

Thurber Consultants Ltd. 1983b. Rogers Pass revision. Volume 2. Hydrology and debris flow potential. File 17-6-54/55 dated February 1983.

Thurber Consultants Ltd. 1983c. Rogers Pass revision. Volume 4. Earthworks design recommendations, drainage and erosion control, borrow and aggregates. File 17-6-58 dated February 1983.

Thurber Consultants Ltd. 1983d. Rogers Pass revision. Volume 5. Beaver valley grade 1982 route investigation part 1. File 17-6-58 dated February 1983.

Thurber Consultants Ltd. 1983e. Rogers Pass revision. Volume 5. Beaver valley grade 1982 route investigation part 2. File 17-6-58 dated February 1983.

Thurber Consultants Ltd. 1983f. Rogers Pass revision. Volume 5. Beaver valley grade 1982 route investigation part 3. File 17-6-58 dated February 1983.

Thurber Consultants Ltd. 1983g. Rogers Pass revision. Volume 6. Bridge foundation investigations. File 17-6-56 dated February 1983.

Thurber Consultants Ltd. 1983h. Rogers Pass revision. Volume 7. Earth retaining structures alternative designs (abridged). File 17-6-59 dated February 1983.